IN THE SPECIFICATION:

Please replace the following paragraph on page 3, lines 10-20 with the following amended paragraph:

The decision on which chaining method to use to solve a problem or, whether a combination of both forward and backward chaining is to be used to solve a problem, depends on the nature of the problem. Forward chaining runs more efficiently if the following conditions are satisfied: a) all the facts are available and all possible conclusions from the facts are needed; and, b) the number of ways to reach a particular desired conclusion is large, but the number of conclusions that are likely derived from the facts is small. Backward chaining is appropriate if the following conditions are satisfied: a) if facts have not be gathered, and only one of many possible conclusions (such as a query to see if a particular conclusion is true) is required; and, b) if the facts may likely lead to a large number of conclusions, but the paths to reach the required conclusion is small.

Please replace the following paragraph on page 4, lines 1-22 with the following amended paragraph:

The typical rule-based system has a relatively static set of rules while the collection of facts ((knowledge base) changes continuously with time. However, in most rule-based systems and applications, the collection of facts is also relatively static from one rule operation cycle to the next. Empirically, although new facts arrive and old ones are removed continuously, the percentage of facts that change per unit time is usually relatively small. For this reason, the obvious blind search oriented approach implemented for the rules-based system shell is very inefficient in performance as it consumes a large amount of computation because the entire ruleset has to be cycled whenever a new fact is added or deleted from the knowledge base. This blind search approach implementation has a computational complexity equal to:

PAGE 9/21 * RCVD AT 4/22/2004 4:30:56 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:5167424366 * DURATION (mm-ss):06-44

([number of rules * number of facts in the fact base]**{[average number of tests per rule antecedent}])

which increases exponentially with the average number of test per rule antecedent. Since only a small amount of facts is changed, most of the tests (in the antecedents) made on each iteration will have the same results as the previous ones. This observation has become the basis of an algorithm, known as the RETE algorithm, as described in "Rete: A Fast Algorithm for the Many Pattern/Many Object Pattern Match Problem", Charles L. Forgy, Artificial Intelligence 19 (1982), 17-37, the contents and disclosure of which is incorporated herein. This algorithm is based on the incremental matching of rule antecedents and has become the bases of a whole generation of efficient rules-based systems, e.g., OPS5, ART and CLIPS.

Please replace the following paragraph on page 5, lines 1-9 with the following amended paragraph:

The main idea of the RETE algorithm is to save the state of the bindings at the end of a given iteration cycle and, in the next cycle, generating only a list of the changes to be incorporated to the binding set as a function of the changes that have affected the binding set. The computational complexity of rule based system based on the RETE algorithm now becomes linear and equal to:

({number of rules * number of facts in the fact base * average number of tests per rule antecedent})

and is a substantial improvement over the blind search oriented implementation.

PAGE 10/21 * RCVD AT 4/22/2004 4:30:56 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:5167424366 * DURATION (mm-ss):06-44